07/24/2022

Student ID: 8203671
Name: Kinga Skiers
Real Project: Embodied Media
Supervisor: Kouta Minamizawa, Yun Suen Pai
kinga.skiers@gmail.com
kinga-skiers@keio.jp

Dear KMD Ethical Review Committee

I would like to request for approval of conducting the following experiment as a part of my research on "Transcendental Avatar: Experiencing Bioresponsive Avatar of the Self for Improved Cognition".

1. Goal and Objective

Transcendental Avatar is a VR experience where a user's cognitive and emotional state are portrayed and amplified as a form of biofeedback therapy. We sense their electrodermal activity and heart rate, and use these signals to make the virtual avatar visually responsive.

The goal of the experiment is to determine the effects of a bioresponsive avatar in VR towards the user's own cognitive and emotional state based on their physiological responses. The avatar will reflect not just the user's own motions, but allow them to more accurately and visually perceive their cognitive and emotional states.

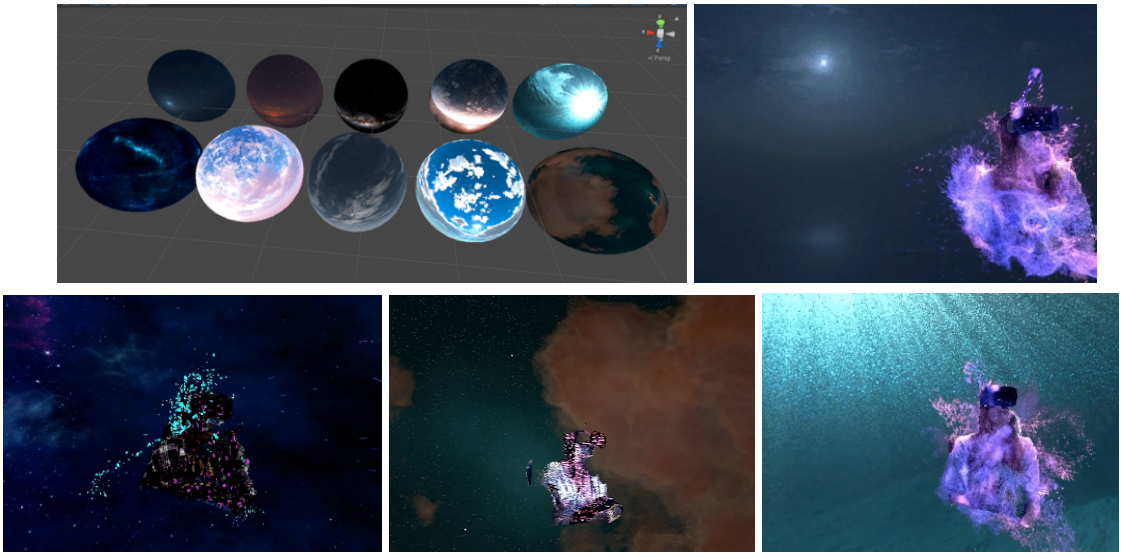

Figure 1: Avatar representation of the participant in 3 different versions, across 10 different virtual backgrounds

2. Hypothesis and Experimental Design

- Hypothesis: Experiencing an avatar that reflects the user's own cognitive and emotional state can reduce their perceived stress and increase emotional valence
- Experimental Design: We will carry out a within-subject study and let participants experience each condition in a Latin Square order. We expect to recruit about 30 participants in total. The experimental conditions are three different avatar designs, high particle-points avatar, medium particle-squares avatar and low particle-lines

avatar in 10 environments: ocean, 4 types of galaxy and 5 types of sky (Shown in Figure 1). After they experience each condition, we collect their physiological data (EDA and heart rate) as well as their questionnaire responses for analysis.

3. Experimental Tools

- Windows PC- to run a program, collect data
- Kinect Azure - to first capture the point cloud of the user then adjust their abstract rendition in VR using Touch Designer
- VR Headset (Oculus Rift S)
- Wearable heart rate sensor, electrodermal activity sensors - for collecting physiological data

4. Experimental Procedure

First, the participants will be informed about their rights to participate in the research. Next, they are required to wash their hands to reduce any sensing noise, then we will assist them with wearing the sensing device. After that, the participants are required to answer a pre-survey questionnaire regarding their perceived workload, stress level, and emotional state. The VR experience will then commence, where they are required to sit, put on the VR headset and experience an experimental condition depending on the assigned order, which lasts for 10 minutes. During this process, we log the changes in their electrodermal activity and heart rate. Then, participants will be given a second questionnaire to report their current cognitive and emotional state. After resting for 5 minutes, this procedure is repeated for the duration of the remaining experimental conditions. At the end of the experiment, each participant will be interviewed regarding their general feedback of the experience. The experiment lasts for approximately 40 minutes.

5. Place and Period of the Experiment

Takeshiba Laboratory and Hiyoshi Campus Media Studio
Period: August

6. Estimated Number, Age, Gender and Other Characteristics of the Subjects

- Estimated Number: 30
- Age: 20-40
- Sex: about half male, half female
- Can communicate in English without problems
- They are comfortable with anonymously answering questionnaires related to their cognitive and emotional states
- They provide consent regarding the use of their collected data to be published at international conferences or journals

7. Expected Results and Outcome

Research on new methods of relaxation in VR and how this process may be affected by the presence of an avatar.

- EDA: demonstrates lower stress and arousal positive emotions

- Heart rate variability: indicates less stress
- Lower stress and anxiety performance
- Virtual Reality nature-based space lower stress

8. Privacy Policy and Treatment of the Results

The data to be collected are EDA, heart rate, videos, photos, and questionnaires conducted before and after the experience, which record the age, gender, current feelings, physiological state and appearance (without face features) of the participants participating in the event. Results will be used for academic research only, will be fully anonymised and no video or audio recordings will be released to any third parties under no circumstances. The data we collect does not contain any personal information about participants except the demographic information (age, gender) that they filled in questionnaires. The data will be stored in a cloud server managed by the moonshot PI for 5 years. Only researchers within the project can access the data. The experiment will be conducted with the most care so that the participant will not be injured or have an accident. If something goes wrong, participants will feel uncomfortable or a problem occurs with the experienced person, the experiment will be canceled immediately.

9. Risk Factors and Safety Considerations

- Covid-19: All of the participants will be required to wear a face mask during the experiment. They are also required to sanitize their hands prior to the study. The VR headset, as well as any device that requires physical contact will be disinfected after each participant
- Motion sickness: The VR headset has a slight chance of causing motion sickness while in VR. The participants are free to stop the experiment anytime if they choose to do so.

10. Collaborators & Sponsors

This research is supported by the JST Cybernetic Being Moonshot project

11. Supplemental documents (cf. questionnaire form, consent form)

Participant Consent Form:
Panas Pre-survey questionnaires:
Panas Post-survey questionnaires:
PANAS-GEN (Eng)
Participant Consent Form

PARTICIPANT CONSENT FORM

DESCRIPTION: You are invited to participate in an experiment to understand the connection between your physiological state in Virtual Reality, and relaxation processes.

TIME INVOLVEMENT: The length of the experiment will be approximately 45 minutes.

DATA COLLECTION: We will collect your demographic information and your answers on the online survey forms. During the experiment, all of your performances will be videotaped. All the information we collected in the study will be coded, stored, and processed anonymously.

RISKS AND BENEFITS: Under the Covid-19 situation, we ensure that we clean the apparatus and tools before and after each experiment. We guarantee no data misuse, and privacy is completely preserved.

PARTICIPANTS' RIGHTS: You have the right to omit or refuse to answer or respond to any questions on the survey forms. You have the right to refuse any behavioral tasks that you are asked to perform. You have the right to pause or terminate the experiment at any time. You have the right to have your questions regarding the procedure answered. If you have any questions as a result of reading this information sheet, feel free to ask the researcher before the experiment begins.

CONFIDENTIALITY/ANONYMITY: If you have read this form and have decided to provide your consent, please understand that the results of this study may be presented at scientific or professional meetings or published in scientific journals. Your identity will not be disclosed unless we directly inform and ask for your permission.

FOR FURTHER INFORMATION: If you have any questions, concerns, or complaints about this research, its procedures, risks, and benefits, please reach out to the following person:
Name: Yun Suen Pai
email: pai@kmd.keio.ac.jp

☐ I agree that the data collected in this study can be published and shown during presentations in an anonymized form.
☐ I confirm that I have read, understood, and agree to the terms and conditions above.
☐ I permit the usage and/or publication of anonymized photo and/or video materials that include me participating in this experiment.

_____ _____

Participant's Name Signature & Date

THE OHIO STATE UNIVERSITY

Positive and Negative Affect Schedule (PANAS-SF)

Indicate the extent you have felt this way over the past week.		Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
PANAS 1	Interested	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 2	Distressed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 3	Excited	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 4	Upset	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 5	Strong	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 6	Guilty	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 7	Scared	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 8	Hostile	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 9	Enthusiastic	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 10	Proud	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 11	Irritable	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 12	Alert	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 13	Ashamed	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 14	Inspired	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 15	Nervous	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 16	Determined	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 17	Attentive	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 18	Jittery	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 19	Active	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
PANAS 20	Afraid	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

Scoring:

***Positive Affect Score*:** Add the scores on items 1, 3, 5, 9, 10, 12, 14, 16, 17, and 19. Scores can range from 10 – 50, with higher scores representing higher levels of positive affect.
Mean Scores: 33.3 (SD±*7.2)*

***Negative Affect Score*:** Add the scores on items 2, 4, 6, 7, 8, 11, 13, 15, 18, and 20. Scores can range from 10 – 50, with lower scores representing lower levels of negative affect.
Mean Score: 17.4 (SD ± 6.2)

Your scores on the PANAS: Positive: ____ Negative: ____

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of personality and social psychology*, *54*(6), 1063.